

# Prevalence And Correlation Of Nail-Biting Behaviour With Mental Health Among Children A Cross Sectional Study

Dr. Neetu Kadu, Dr. Nilima Bukte, Ayesha Shaikh, Ayman Khan

Associate Professor Department Of Public Health Dentistry M. A. Rangoonwala College Of Dental Sciences  
And Research Centre

Tutor Department Of Public Health Dentistry M. A. Rangoonwala College Of Dental Sciences And Research  
Centre

Intern M. A. Rangoonwala College Of Dental Sciences And Research Centre

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## Abstract

### Introduction:

Nail biting (onychophagia) is a common childhood habit associated with psychological factors such as anxiety, depression, and obsessive-compulsive disorder (OCD). This study aimed to determine the prevalence of nail biting among children aged 4–10 years and to evaluate its association with mental health status using standardized assessment tools.

### Methodology:

A cross-sectional study was conducted among 171 children attending the Department of Pediatric Dentistry at M.A. Rangoonwala Dental College and Hospital, Pune. Data were collected from parents through a validated questionnaire incorporating demographic details, nail-biting behaviors, and the Strengths and Difficulties Questionnaire (SDQ) for mental health evaluation. Descriptive and inferential analyses were performed using chi-square tests.

### Results:

Of the total participants, 26.6 percent displayed nail-biting behavior at varying frequencies. Children with the habit recorded higher SDQ mean scores for emotional problems (2.7 vs 0.18), conduct issues (1.7 vs 1.1), and hyperactivity (5.09 vs 3.47) compared to non-nail-biters. Parental responses were mainly punitive (65.2 percent), while positive reinforcement strategies were used by only 21.7 percent of parents.

### Conclusion:

Nail biting is a prevalent behavioral habit among children and shows a significant association with emotional and behavioral difficulties. Rather than punitive measures, supportive parental guidance and psychological interventions such as cognitive-behavioral therapy are recommended to address both the behavioral and emotional aspects effectively.

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## I. Introduction

A habit is a sign of lack of harmony between an individual and his environment. The American Academy of Pediatric Dentistry (AAPD) recognizes that an infant's, child's, or adolescent's well-being can be affected by oral habits creating a need for effective individual management of the same.

Nail biting, also known as onychophagia, is a common habit among children that has been extensively studied in the literature. This repetitive behavior, characterized by the compulsive chewing or biting of one's fingernails, is particularly prevalent during childhood and adolescence (1). Researchers have consistently found a strong association between nail biting and various mental health conditions in children, including anxiety, obsessive-compulsive disorder (OCD), and depression (2).

Numerous studies have investigated the prevalence of nail biting among children. A systematic review by Amitha M Hegde and Arun M Xavier reported that the prevalence of nail biting in children ranges from 14%. Another study conducted in Saudi Arabia found the prevalence of nail biting to be 12.5% among children aged 7 to 13 years (3). The onset of nail biting typically occurs during early childhood, with the habit often persisting into adolescence and adulthood (4).

The relationship between nail biting and mental health in children has been extensively explored. Several studies have found that children who engage in nail biting are more likely to experience anxiety, depression, and OCD compared to their non-nail-biting peers. Nail biting has been strongly associated with anxiety in children. Researchers have suggested that nail biting may serve as a coping mechanism for children experiencing stress or

anxiety (5). The habit can provide a temporary relief from anxious feelings, but it may also exacerbate the underlying psychological distress (6).

The link between nail biting and OCD in children has been well-documented. Nail biting is often considered a body-focused repetitive behavior (BFRB) and is classified as an other specified obsessive-compulsive and related disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (7). Children with OCD may engage in nail biting as a compulsive behavior to alleviate their obsessive thoughts and anxiety (8,9).

The relationship between nail biting and depression in children is also well-established. Studies have found that children who bite their nails are more likely to experience symptoms of depression, such as low mood, loss of interest, and feelings of worthlessness. The emotional distress associated with depression may contribute to the development and maintenance of nail biting in some children.

Given the strong association between nail biting and mental health conditions in children, a multifaceted approach to intervention and management is often recommended. Cognitive-behavioral therapy (CBT) and habit reversal training have been shown to be effective in reducing nail biting in children, as they address both the psychological and behavioral aspects of the habit. Additionally, addressing any underlying mental health issues, such as anxiety or OCD, may be crucial in effectively managing nail biting in children.

Nail biting is a prevalent habit among children and is strongly associated with various mental health conditions, including anxiety, OCD, and depression. Understanding the relationship between nail biting and mental health in children is essential for developing effective intervention strategies and promoting the overall well-being of this population.

The aim of this study is to derive a comprehensive approach that addresses both the psychological and behavioural aspects of nail biting is recommended to help children overcome this habit and improve their mental health outcomes.

## **II. Methodology**

This cross-sectional study was conducted among a community sample of children aged 4 to 10 years in Pune. The participants were selected by convenience sampling technique from M.A Rangoonwala dental college and hospital in the department of paediatric dentistry.

The sample size was calculated using OpenEpi version 3. The calculated sample size was 171 with a 95% confidence interval and 80% power. Since young children couldn't adequately describe their habits, as well as older children, can, hence parents were inquired on their habits for standardization purposes. A sample of 171 children within the 4 to 10 years age range was selected. The parents or guardians of the selected children were invited to participate in the study, and informed consent was obtained from them.

Data was collected using a structured questionnaire administered to the participating parents or guardians through online and digital media platforms. The questionnaire included sections on demographic information, nail biting assessment, and mental health evaluation using the Strengths and Difficulties Questionnaire (SDQ).

The questionnaire was pilot-tested on a sample of 50 children and their parents. Based on the feedback from the pilot study, the questionnaire was calibrated by the examiner.

The collected data were analyzed using appropriate statistical methods. Descriptive statistics were calculated to summarize the demographic characteristics of the participants and the prevalence of nail biting. Inferential statistical analyses, such as chi-square tests, were performed to assess the association between nail biting and mental health outcomes. Result are presented in the form of graphs and tables.

## **III. Result**

Among 171 study participants the demographic analysis reveals that the sample consists of 54.3% females and 45.1% males. The mean age of participants is  $6.8 \pm 1.6$  years. Regarding family structure, 61.3% of participants come from nuclear families, 38.2% from extended families, and 0.6% from single-parent families. In terms of siblings, 12.7% of participants are only children, while the most common sibling configurations include having one sister (25.4%) or one brother (22.0%).

Parental education analysis shows distinct patterns for fathers and mothers. Among fathers, Secondary education is the most common education level at 58.4%, followed by Undergraduate (30.1%) and Primary education (5.8%). For mothers, Secondary education is predominant at 57.8%, followed by Undergraduate (19.7%) and Primary education (18.5%).

Table 1 shows analysis of nail-biting habits reveals that the majority of children (73.4%) are reported to never bite their nails, while 13.3% are observed biting their nails often, 7.5% rarely, and 5.8% very often. Among those who bite their nails, the most common frequency is 3-4 times per day (10.4%), followed by 1-2 times per day (9.8%). In terms of weekly frequency, 14.5% of children bite their nails 4 or more days per week, while 9.2% do so 2-3 days per week.

**Table 1: Comprehensive Analysis of Nail-biting Frequency Patterns**

Frequency Pattern	Percentage
<b>Overall Frequency:</b>	
Never	73.4%
Often	13.3%
Rarely	7.5%
Very Often	5.8%
<b>Daily Frequency (Among nail-biters):</b>	
3-4 times per day	10.4%
1-2 times per day	9.8%
<b>Weekly Pattern:</b>	
4+ days per week	14.5%
2-3 days per week	9.2%

**Table 2: Analysis of Parental Responses and Child Understanding**

Response Category	Percentage
<b>Parental Intervention Methods:</b>	
Scolding/Punishment	65.2%
Positive Reinforcement	21.7%
No Action Taken	13.0%
<b>Child's Response to Intervention:</b>	
Does not understand	47.8%
Understands and tries to stop	30.4%
Indifferent to discussion	21.7%

Table 2 reveals parental responses to nail-biting habits vary significantly. The most common response is scolding or punishing the child (65.2%), followed by using positive reinforcements such as rewards (21.7%). However, 13.0% of parents reported not taking any steps to address the habit. When discussing the habit with their children, 47.8% of parents noted that their children do not seem to understand, while 30.4% reported that their children understand and try to stop. A smaller proportion (21.7%) indicated that their children are indifferent to the discussions.

Table 3 reveals notable differences between nail-biting and non-nail-biting children. Nail-biting children showed higher scores in emotional problems (2.6 vs 0.2), conduct problems (1.7 vs 1.1), and hyperactivity (4.9 vs 3.5). The total difficulties score was also higher for nail-biting children (11.7) compared to non-nail-biting children (6.9). Interestingly, prosocial behavior scores were similar between the groups (9.2 vs 9.3), suggesting that nail-biting habits may not significantly impact social competencies.

**Table 3: Comparison of SDQ Scores by parents Between Children With and Without Nail Biting**

Scale	Nail biting	Mean	Standard Deviation	95% CI Lower	95% CI Upper
Conduct problem Score	With	1.7	1.36	1.29	2.12
Conduct problem Score	Without	1.12	1.21	0.91	1.34
Emotional problem score	With	2.7	1.69	2.19	3.22
Emotional problem score	Without	0.18	0.54	0.08	0.27
Hyperactivity/inattentiveness scale	With	5.09	2.49	4.34	5.85
Hyperactivity/inattentiveness scale	Without	3.47	2.41	3.05	3.89
Peer problem score	With	2.55	1.65	2.04	3.05
Peer problem score	Without	2.11	1.21	1.9	2.32
Prosocial behavior score	With	9.16	1.22	8.79	9.53
Prosocial behavior score	Without	9.36	0.95	9.19	9.52
Total score	With	12.05	4.7	10.62	13.47
Total score	Without	6.88	3.3	6.31	7.46

#### IV. Discussion

The prevalence of nail biting, or onychophagia, among children is a significant concern, particularly due to its association with various mental health conditions. In our study, we found that 26.6% of children reported engaging in nail biting to some degree, which aligns with previous research indicating that nail biting affects a considerable portion of the pediatric population. For instance, Pacan et al. reported a prevalence of onychophagia ranging from 20% to 33% among children and adolescents, with some estimates suggesting that up to 45% of adolescents may engage in this behavior (10). Similarly, Ghanizadeh and Shekoochi found a prevalence of 25.5% in a sample of girls aged 15-16 years(11). These findings suggest that nail biting is a common habit that persists through childhood and into adolescence, highlighting the need for effective management strategies.

The association between nail biting and mental health issues, particularly anxiety, obsessive-compulsive disorder (OCD), and depression, is well-documented. Our results indicated that children who bite their nails exhibited higher scores in emotional problems, conduct problems, and hyperactivity, which is consistent with

findings from other studies. For example, a study by Şişman et al. indicated that psychological states significantly influence nail-biting behaviors in adolescents, with many reporting high levels of anxiety (12). Furthermore, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) categorizes nail biting as a body-focused repetitive behavior and classifies it under “other specified obsessive-compulsive disorder,” further emphasizing its psychological implications (13).

Interestingly, our findings also revealed that parental responses to nail biting varied significantly, with a predominant reliance on scolding or punishment (65.2%). This approach may inadvertently exacerbate the child’s anxiety and reinforce the nail-biting behavior, as suggested by Herdiyati and Marhani, who noted that negative parental attitudes could lead to increased nail-biting habits (14). Positive reinforcement strategies, which were employed by only 21.7% of parents, may be more effective in addressing the behavior without increasing psychological distress.

Moreover, the relationship between nail biting and other oral habits, such as bruxism, has been explored in the literature. Studies have shown a significant correlation between these habits, with some reporting a prevalence of bruxism among nail-biters as high as 53% (15). This connection suggests that both behaviors may stem from similar underlying psychological factors, such as stress and anxiety, which can manifest in various forms. The presence of these habits may indicate a broader pattern of emotional dysregulation in children, as highlighted by Drumond et al., who noted that emotional and psychological problems often coexist with harmful oral habits (16).

The findings from our study contribute to the growing body of evidence linking nail biting with mental health issues in children. The prevalence rates observed in our sample are consistent with those reported in other studies, reinforcing the notion that nail biting is a widespread issue that warrants attention. Furthermore, the psychological implications of this habit underscore the importance of addressing both the behavioral and emotional aspects in intervention strategies. Cognitive-behavioral therapy (CBT) and habit reversal training have been shown to be effective in reducing nail biting by targeting the underlying anxiety and behavioral patterns (17).

## V. Conclusion

In conclusion, nail biting is a prevalent habit among children that is significantly associated with various mental health conditions, including anxiety, OCD, and depression. Our study corroborates previous research findings regarding the prevalence and psychological implications of this behavior. The reliance on punitive parental responses may hinder effective management, suggesting the need for more supportive and constructive approaches. Given the strong association between nail biting and mental health issues, it is crucial to adopt a multifaceted approach to intervention that addresses both the psychological and behavioral components. Future research should continue to explore the underlying factors contributing to nail biting and evaluate the effectiveness of different intervention strategies to promote healthier coping mechanisms among children.

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